IN THE CLAIMS:

Please cancel Claims 3, 4, 19, and 23 without prejudice to or disclaimer of subject matter. Please amend Claims 1, 5, 12, and 20 to 22 as shown below.

1. (Currently Amended) A detecting method for detecting internal resistance of an inspective rechargeable battery when said inspective rechargeable battery is charged by a constant current-constant voltage charging regime comprising a constant current charging mode and a constant voltage charging mode in that charging is commenced by said constant current charging mode at a constant current value I_0 and after the battery voltage of said inspective rechargeable battery reaches a given voltage value V_{max}, the charging is performed by said constant voltage charging mode at a constant voltage V_{max} until the termination thereof, said detecting method comprising the steps of:

(a) obtaining an accumulated, charged electricity quantity of said inspective rechargeable battery in said constant voltage charging mode; and

(b) comparing said charged electricity quantity obtained in said step (a) to previously acquired data of a normal rechargeable battery in said constant voltage charging mode, said normal rechargeable battery corresponding to said inspective rechargeable ~~battery;~~ battery,

wherein said previously acquired data ~~is~~ are with respect to relationships between charged electricity quantities Q_{cv} of said normal rechargeable battery and increased or decreased internal resistances of said normal rechargeable battery or between said charged electricity quantities Q_{cv} and increased or decreased magnitudes of said internal resistances,

wherein when said inspective rechargeable battery has an electricity storable capacity which is reduced to a magnitude of D time that of said normal rechargeable battery, where D is a constant of $0 < D \leq 1$, said detecting method further includes a step of correcting said charged electricity quantity obtained in said step (a) by multiplying said charged electricity quantity by 1/D time, wherein the corrected electrical quantity is compared to said previously acquired data of said normal rechargeable battery described in said step (b), and

wherein in a case where it is presumed that said electricity storable capacity of said inspective rechargeable battery is reduced to a magnitude of D time that of said normal rechargeable battery, when a duration from a shift time when said constant current charging mode at said constant current value I_0 is shifted to said constant voltage charging mode at said constant voltage V_{max} until a time when the charging current value in said constant voltage charging mode reaches a prescribed current value I_M and an electricity quantity charged in said constant voltage charging mode are made to be respectively t_M' and Q_{cv}' for said inspective rechargeable battery and t_M and Q_{cv} for said normal rechargeable battery, in accordance with a function formula $D = (Q_{cv}' - I_0 \times t_M') / (Q_{cv} - I_0 \times t_M)$, said electricity storable capacity of said inspective rechargeable battery is estimated to be D time that of said normal rechargeable battery.

2. (Previously Presented) The detecting method according to claim 1, wherein said inspective rechargeable battery is a rechargeable battery accommodated in a

rechargeable battery pack having a control circuit in which at least one of a switching element for charging which is capable of performing ON-OFF control, a switching element for discharging, and a detecting element for detecting a charging-and-discharging current value is accommodated in a charging-and-discharging path of said rechargeable battery accommodated in said rechargeable battery pack.

3. (Cancelled)

4. (Cancelled)

5. (Currently Amended) The detecting method according to ~~claim 4~~ claim 1, wherein said prescribed current value I_M is in a range of $0.4 \times I_0 \leqq I_M \leqq 0.6 \times I_0$ with respect to said charging current value I_0 in said constant current charging mode.

6. (Previously Presented) The detecting method according to claim 5, wherein said prescribed current value I_M is 1/2 of said constant current value I_0.

7. (Previously Presented) The detecting method according to claim 1, wherein said previously acquired data of said normal rechargeable battery includes previously measured data of said relationships of said normal rechargeable battery, function formulas obtained from said measured data, and function formulas based on said measured data which are obtained by way of simulation by a computer.

8. (Previously Presented) The detecting method according to claim 7, wherein said previously acquired data of said normal rechargeable battery includes data of relationships between said charged electricity quantities Q_{cv} of said normal rechargeable battery and resistance values r_s based on resistors or includes data of relationships between said charged electricity quantities Q_{cv} and internal resistance values $(R_1 + r_s)$ of said normal rechargeable battery, wherein said data of relationships between said charged electricity quantities Q_{cv} and said internal resistance values $(R_1 + r_s)$ is obtained by a method wherein each of a plurality of resistors each having a different resistance value(r_s) is separately connected to said normal rechargeable battery in series connection to artificially increase an internal resistance value (R_1) of said normal rechargeable battery to a resistance value $(R_1 + r_s)$ as an artificially internal resistance value, wherein in each case where one of said plurality of resistors is connected to said normal rechargeable battery, said normal rechargeable battery is charged by said constant current-constant voltage charging regime comprising said constant current charging mode and said constant voltage charging mode in that charging is commenced by said constant current charging mode at said constant current value I_0 and after the battery voltage of said normal rechargeable battery reaches said given voltage value V_{max}, the charging is performed by said constant voltage charging mode at said constant voltage V_{max} until the termination thereof, and wherein in each case where one of said plurality of resistors is connected to said normal rechargeable battery, a charged electricity quantity Q_{cv} of said normal rechargeable battery is measured and a relationship between said charged electricity quantity Q_{cv} and said artificially internal resistance value of said normal rechargeable battery is obtained.

9. (Previously Presented) The detecting method according to claim 8, wherein said resistance value (r_s) of each of said plurality of resistors is of substantially the same order as said internal resistance value R_1 of said normal rechargeable battery or said resistance value (r_s) of each of said plurality of resistors differs from said internal resistance value R_1 by one digit.

10. (Previously Presented) The detecting method according to claim 8, wherein in each case where one of said plurality of resistors is connected to said normal rechargeable battery, an open-circuit voltage Voc of said normal rechargeable battery when the battery voltage reaches said voltage value V_{max} is measured and a charged electricity quantity Q_{cv} of said normal rechargeable battery in said constant voltage charging mode at that time is measured, and from said constant current value I_0 in said constant current charging mode, said measured open-circuit voltage Voc and said measured charged electricity quantity Q_{cv} and from a function formula $R = (V_{max} - Voc) / I_0$, an internal resistance value of said normal rechargeable battery whose internal resistance value is artificially increased to $(R_1 + r_s)$ is computed, and a relationship between said measured charged electricity quantity Q_{cv} and said computed internal resistance value of said normal rechargeable battery is obtained.

11. (Previously Presented) The detecting method according to claim 1, wherein a time point when said charged electricity quantity of said inspective rechargeable battery in said constant voltage charging mode is measured is any of the following three

time points:

(1) a time point when the charging current in said constant voltage charging mode is sufficiently decreased to a prescribed current value (I_{min});

(2) a time point when a prescribed time (t_n) elapses since the time when the charging current value in said constant voltage charging mode reaches a prescribed current value (I_n); and

(3) a time point when a prescribed time (t_f) elapses since the time when said constant current charging mode is shifted to said constant voltage charging mode.

12. (Currently Amended) The detecting method according to claim 1, wherein after said internal resistance of said inspcctive rechargeable battery is predicted to be R on the basis of said previously acquired data, it is presumed that a total discharged electricity quantity C_d of said normal rechargeable battery whose internal resistance is R_1 is expressed by $C_d = C_N \times f_{T,I}(R_1)$ from an electricity storable capacity C_N of said normal rechargeable battery and a correction coefficient $f_{T,I}(R_1)$ for a discharged electricity quantity of said normal rechargeable battery which is determined by said internal resistance R_1 at a battery temperature T and a discharging current I, and wherein in a case where electricity storable capacity is not reduced in said inspective rechargeabe battery, a total discharged electricity quantity C_d' of said inspective rechargeable battery is expressed by $C_d' = C_N \times f_{T,I}(R)$ from said electricity storable capacity C_N of said normal rechargeable battery and a correction coefficient $f_{T,I}(R)$ for a discharged quantity of said normal rechargeable battery having said internal resistance value R at a battery temperature T and a

discharging current I, with said internal resistance value R being computed by artificially increasing R_1 by a magnitude of r_s, and wherein when for an instrument in which said inspective rechargeable battery is used as a power source, an average consumption electric current of the instrument is made to be i, an average consumption power of the instrument is made to be p, an average discharging voltage of said normal rechargeable battery when it is discharged at a discharging current value i is made to ~~be V_m', and~~ be V_m, and an average discharging voltage of said inspective rechargeable battery when it is discharged at said discharging current value i is made to be V_m', a time h during which said instrument is capable of being operated is computed in accordance with an equation

$h = C_d' / i$ or $h = (V_m' \times C_d') / p$, where $V_m' = V_m - i \times (R - R_1) = V_m - i \times r_s$.

13. (Previously Presented) The detecting method according to claim 12, wherein said correction coefficient $f_{1,I}$ (R_1) for said discharged electricity quantity of said normal rechargeable battery is selected from (i) previously acquired data relating to correction coefficients for discharged electricity quantities and (ii) function formulas obtained by simulation by a computer based on said previously acquired data relating to correction coefficients.

14. (Previously Presented) The detecting method according to claim 13, wherein said previously acquired data of said normal rechargeable battery includes data of relationships between internal resistance values $(R_1 + r_s)$ and discharged electricity quantities C_d of said normal rechargeable battery, wherein said internal resistance values $(R_1 + r_s)$ and

said discharged electrical quantities C_d are obtained by a method wherein each of a plurality of resistors each having a different resistance value (r_s) is separately connected to said normal rechargeable battery in series connection to artificially increase said internal resistance value (R_i) of said normal rechargeable battery to a resistance value ($R_i + r_s$) as an artificially increased resistance value, and wherein in each case where one of said plurality of resistors is connected to said normal rechargeable battery, said normal rechargeable battery is charged by said constant current-constant voltage charging regime comprising said constant current charging mode and said constant voltage charging mode in that charging is commenced by said constant current charging mode at said constant current value I_0 and after the battery voltage of said normal rechargeable battery reaches said given voltage value V_{max}, the charging is performed by said constant voltage charging mode at said constant voltage V_{max} until the termination thereof and after the charging is terminated, said normal rechargeable battery is discharged at a prescribed battery temperature T and a prescribed discharging current value I until the battery voltage of said normal rechargeable battery reaches a prescribed voltage value V_{min}, where a discharged electricity quantity C_d is measured, and a relationship between said measured discharged electricity quantity C_d and said artificially increased internal resistance value of said normal rechargeable battery is obtained.

15. (Previously Presented) The detecting method according to claim 14, wherein said resistance value (r_s) of each of said plurality of resistors is of substantially the same order as said internal resistance value R_i of said normal rechargeable battery or said

resistance value (r_s) of said plurality of resistors differs from said internal resistance value R_1 by one digit.

16. (Previously Presented) The detecting method according to claim 13, wherein said previously acquired data of said normal rechargeable battery includes data of relationships between internal resistance values ($R_1 + r_s$) and discharged electricity quantities C_d of said normal rechargeable battery, wherein said internal resistance values ($R_1 + r_s$) and said discharged electricity quantities C_d are obtained by a method wherein each of a plurality of resistors each having a different resistance value (r_s) is separately connected to said normal rechargeable battery in series connection to artificially increase an internal resistance value (R_1) of said normal rechargeable battery to a resistance value ($R_1 + r_s$) as a pseudo-internal resistance value, and wherein in each case where one of said plurality of resistors is connected to said normal rechargeable battery, said normal rechargeable battery is charged by said constant current-constant voltage charging regime comprising said constant current charging mode and said constant voltage charging mode in that charging is commenced by said constant current charging mode at said constant current value I_0 and after the battery voltage of said normal rechargeable battery reaches said given voltage value V_{max}, the charging is performed by said constant voltage charging mode at said constant voltage V_{max} until the termination thereof and after the charging is terminated, said normal rechargeable battery is discharged at a prescribed battery temperature T and a prescribed discharging current value I until the battery voltage of said normal rechargeable battery reaches a prescribed voltage value V_{min}, where a discharged electricity quantity C_d of said

normal rechargeable battery is measured, and an open-circuit voltage Voc of said normal rechargeable battery when the battery voltage reaches said voltage value V_{max} in said constant current-constant voltage charging operation is measured, and from said constant current value I_0 in the constant current charging mode and said measured open-circuit voltage Voc and in accordance with a function formula $R = (V_{max} - Voc) / I_0$, an internal resistance value of said normal rechargeable battery whose internal resistance value is artificially increased to R, with R equaling $R_1 + r_s$, is computed, and a relationship between said measured discharged electricity quantity C_d and said computed internal resistance value R of said normal rechargeable battery is obtained.

17. (Previously Presented) The detecting method according to claim 16, wherein said resistance value (r_s) of each of said plurality of resistors is of substantially the same order as said internal resistance value R_1 of said normal rechargeable battery or said resistance value (r_s) of said plurality of resistors differs from said internal resistance value R_1 by one digit.

18. (Previously Presented) The detecting method according to claim 12, wherein in a case where said inspective rechargeable battery has an electricity storable capacity which is reduced to a magnitude of D time that of said normal rechargeable battery, where D is a constant of $0 < D \leq 1$, it is presumed that said total discharged electricity quantity C_d' of said inspective rechargeable battery is expressed by $C_d' = D \times C_N \times f_{-T, I}(R)$ from said electricity storable capacity C_N of said normal

rechargeable battery and said correction coefficient $f\_{T, I}$ (R).

19. (Cancelled)

20. (Currently Amended) The detecting method according to ~~claim 19~~ claim 18, wherein said prescribed current value I_M is in a range of $0.4 \times I_0 \leq I_M \leq 0.6 \times 10$.

21. (Currently Amended) The detecting method according to ~~claim 19~~ claim 18, wherein said prescribed current value I_M is 1/2 of said constant current value I_0 in said constant current charging mode.

22. (Currently Amended) A detecting apparatus for detecting internal resistance of an inspective rechargeable battery when said inspective rechargeable battery is charged by a constant current-constant voltage charging regime comprising a constant current charging mode and a constant voltage charging mode in that charging is commenced by said constant current charging mode at a constant current value I_0 and after the battery voltage reaches a given voltage value V_{max}, the charging is performed by said constant voltage charging mode at a constant voltage V_{max} until the termination thereof, said detecting apparatus comprising:

(i) means for measuring a voltage of said inspective rechargeable battery;

(ii) means for acquiring an accumulated, charged electricity quantity of said inspective rechargeable battery in said constant voltage charging mode;

(iii) means for memorizing previously acquired data of a normal rechargeable battery in said constant voltage charging mode, said normal rechargeable battery corresponding to said inspective rechargeable battery, wherein said previously acquired data ~~is~~ are with respect to relationships between charged electricity quantities of said normal rechargeable battery and increased or decreased internal resistances of said normal rechargeable battery or increased or decreased magnitudes of said internal resistances; and

(iv) means for comparing said charged electricity quantity obtained by said means (ii) to said previously acquired data memorized by said means (iii), wherein internal resistance of said inspective rechargeable battery is detected from said previously acquired data memorized by said means (iv),

wherein in a case where said inspective rechargeable battery has an electricity storable capacity which is reduced to a magnitude of D time that of said normal rechargeable battery, where D is a constant of $0 < D \leq 1$, said detecting apparatus has a further means for correcting said charged electricity quantity by multiplying said charged electricity quantity by 1/D time prior to comparison by said means (iv), and

wherein in a case where it is presumed that said electricity storable capacity of said inspective rechargeable battery is reduced to a magnitude of D time that of said normal rechargeable battery, when a duration from a shift time when said constant current charging mode at said constant current value I_0 is shifted to said constant voltage charging mode at said constant voltage V_{max} until a time when the charging current value in said constant voltage charging mode reaches a prescribed current value I_M and an electricity quantity charged in said constant voltage charging mode are made to be respectively t_M' and Q_{cv}' for said inspective rechargeable battery and t_M and Q_{cv} for said normal rechargeable battery, in accordance with a function formula $D = (Q_{cv}' - I_0 \text{ x } t_M') / (Q_{cv} - I_0 \text{ x } t_M)$, said electricity storable capacity of said inspective rechargeable battery is estimated to be D time that of said normal rechargeable battery.

23. (Cancelled)

24. (Original) The detecting apparatus according to claim 22, wherein said inspective rechargeable battery is a rechargeable battery accommodated in a rechargeable battery pack.

25. (Previously Presented) The detecting apparatus according to claim 24, wherein said rechargeable battery pack has a control circuit in which at least one of a switching element for charging which is capable of performing ON-OFF control, a switching element for discharging, and a detecting element for detecting a charge-and-discharge current value is accommodated in a charging-and-discharging path of said rechargeable battery accommodated in said rechargeable battery pack.

26. (Original) A rechargeable battery pack in which a detecting apparatus defined in claim 22 is accommodated.

27. (Original) An apparatus having a detecting apparatus defined in claim 22 added thereto.

28. (Previously Presented) The apparatus according to claim 27, wherein said apparatus having the detecting apparatus added thereto is selected from the group consisting of inspection equipment for inspecting whether a rechargeable battery is good or defective, chargers for charging a rechargeable battery, portable instruments, and movable bodies .

29. (Previously Presented) A computer-executable program for detecting internal resistance of an inspective rechargeable battery, said program being stored on a computer-readable medium and having a detecting method defined in claim 1 incorporated therein.

30. (Cancelled)

31. (Previously Presented) The apparatus according to Claim 28, wherein said portable instruments are selected from the group consisting of cellular phones, personal digital assistants, and portable type computers, and wherein said movable bodies are selected from the group consisting of motorcycles, automobiles, ships, aircrafts, and space crafts.

32. (Previously Presented) The detecting method according to claim 14,

wherein said previously acquired data of said normal rechargeable battery includes data of a relationship between said internal resistance value R_I and a discharged electrical quantity C_d, which are obtained by charging said normal rechargeable battery by said constant current-constant voltage charging regime without a resistor being connected to said normal rechargeable battery, such that said correction coefficient $f_{\_T, I}(R_I)$ becomes C_d/C_N.

33. (Previously Presented) The detecting method according to claim 16, wherein said previously acquired data of said normal rechargeable battery includes data of a relationship between said internal resistance value R_I and a discharged electrical quantity C_d, which are obtained by charging said normal rechargeable battery by said constant current-constant voltage charging regime without a resistor being connected to said normal rechargeable battery, such that said correction coefficient $f_{\_T, I}(R_I)$ becomes C_d/C_N.